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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/524,967	02/18/2005	Sebastien Roux	034299-622	2950
46188	7590	11/06/2009	EXAMINER	
Nixon Peabody LLP P.O. Box 60610 Palo Alto, CA 94306			ALLISON, ANDRAE S	
			ART UNIT	PAPER NUMBER
			2624	
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			11/06/2009	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/524,967	<b>Applicant(s)</b> ROUX ET AL.	
	<b>Examiner</b> ANDRAE S. ALLISON	<b>Art Unit</b> 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on Amendment filed 10/21/2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-5,7 and 9-10 is/are rejected.
- 7) ☒ Claim(s) 2,6 and 8 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02/18/2009 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Specification***

1. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

#### **Arrangement of the Specification**

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
  - (1) Field of the Invention.
  - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Art Unit: 2624

3. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "the focal point" in line 3. There is insufficient antecedent basis for this limitation in the claim.

Claims 2-10 are being rejected as incorporating the deficiencies of the claim upon which each respective claim depends.

### ***Claim Rejections - 35 USC § 101***

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 1-10 are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. Supreme Court precedent<sup>1</sup> and recent Federal Circuit decisions<sup>2</sup> indicate that a statutory "process" under 35 U.S.C. 101 must (1) be tied to a particular machine or apparatus, or (2) transform a particular article to a different state or thing. This is referred to as the "machine or transformation test", whereby the recitation of a particular machine or transformation of an article must impose meaningful limits on the claim's scope to impart patent-eligibility (See *Benson*, 409 U.S. at 71-72), and the involvement of the machine or transformation in the claimed process must not

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<sup>1</sup> *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).

<sup>2</sup> *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

Art Unit: 2624

merely be insignificant extra-solution activity (See *Flook*, 437 U.S. at 590"). While the instant claim(s) recite a series of steps or acts to be performed, the claim(s) neither transform an article nor positively tie to a particular machine that accomplishes the claimed method steps, and therefore do not qualify as a statutory process.

As currently claimed the steps such as weighting the measurement of claim 1 could be performed manually, and does not require machine involvement. Furthermore, although the claims recite a qualifying transformation of data because an external (non-data) representation of the physical object or substance, such as a visual depiction of the object image, the object recited is not necessarily a physical object, such as a heart, or lung. Therefore, neither of the requirements for a process has been met.

Claims 2-10 are being rejected as incorporating the deficiencies of the claim upon which each respective claim depends.

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 3-5, 7 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Edic et al (US Patent No.: 7,221,728) (herein referred to as Edic '728) in view of Edic et al (US Patent No.: 6,793,496) (herein referred to as Edic '496).

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Art Unit: 2624

As to independent claim 1, Edic '728 discloses a method for reconstruction of a tomographic image of an especially mobile and deformable object (method for imaging dynamic cardiac tissue by characterizing internal motion – see column 1, lines 14-20), the process comprising: generating, using either emissive source (X-ray source, 12, see Fig 1 and column 3, lines 58-60) located at the focal point (see Fig 1), diverting radiation from a focal point and passing through the object (e.g. human patient 18, see Fig 1 and column 1, lines 62), the focal point being mobile about the object (note that the x-ray source rotates – see column 6, lines 34-36 ), generating an image from set of values of a property taken by points of the object (see column 6, lines 36-40 – where x-ray beams passing through the object is collected by a detector and processed to produce projections), comprising the use of: divergent radiation wherein an analytical model of mobility (differential projection modeled motion – see column 12, lines 40-67) and deformation (note that warping of the reconstruction grid is taken into consideration - see column 12, lines 64-67) of the object defined for each position of the focal point; and an analytical calculation process (see Fig 10) for obtaining said values from totals of the values of the property along projection lines leading to the focal point and passing respectively by the points (see column 12, lines 40-67 through column 13, lines 1-18); further comprising: weighting of the measurements (see column 9, lines 5-10 and see Fig 5), this weighting being dependent on the analytical model of mobility and deformation of the object (see column 9, lines 50-65); derivation of the measurements weighted following the trajectory of the focal point considering a direction adapted to the model, this direction being kept constant, and obtaining modified measurements (note

Art Unit: 2624

that the model is updated using the weighted measurements – see column 9, lines 30-48); retroprojection of the modified measurements (see column 8, lines 7-25) and presenting an image of the object based on said reconstruction (see column 5, lines 35-37).

Note the discussion above, Edic '728 does not teach a variable combination being acquired, this combination comprising translations, rotations and homotheties of the object from an origin. Edic '496 teaches a mathematical model (see column 1, lines 12-15) which includes a variable combination being acquired, this combination comprising translations, rotations and homotheties of the object from an origin (see column 3, lines 38-41 – where rotation, scaling and translation is taken into account for a mathematical model). Edic 728 and Edic 496 are combinable because both are directed to reconstructing heart images. One of ordinary skilled in the art would have been motivated to incorporate Edic 496 into Edic 728 to model the human heart by using a mathematical model defined by an analytic basis for transforming the model by scaling, translation and rotation for each basic object for certain points in time (see column 3, lines 30-44)

As to claim 3, note the discussion above, Edic '496 teaches the process for reconstruction of an image, characterised in that it is applied with a particular analytical mobility and deformation model at each point of the object (see column 3, lines 37-44).

As to claim 4, note the discussion above, Edic '728 teaches the process for

Art Unit: 2624

reconstruction of an image, characterised in that the improved linear part of the particular analytical model corresponds to the improved local approximation of a family of trajectories passing through points located in the region of each point (see column 6, lines 24-37).

As to claim 5, note the discussion above, Edic '496 teaches the process for reconstruction of an image, characterised in that the directions of the projection lines are considered at the point of the object where the process is applied (35 –see Fig 6).

As to claim 7, note the discussion above, Edic '728 teaches the process for reconstruction of an image, characterised in that the general law of evolution of the object is periodical and in that the reference instants are selected for the same phase of periods of movement of the object (see column 8, lines 26-35).

As to claim 10, note the discussion above, Edic '496 teaches the process for reconstruction of an image, characterised in that the improved model is obtained by approximation of real deformations of the object according to an approximation criterion (see column 5, lines 48-64).

8. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Edic et al (US Patent No.: 7,221,728) (herein referred to as Edic '728) in view of Edic et al (US



Art Unit: 2624

Patent No.: 6,793,496) (herein referred to as Edic '496) further in view of Azevedo et al (US Patent No.: 5,475,726).

As to claim 9, Edic 728 in view of Edic 496 does not teach the process for reconstruction of an image, characterised in that weighting of the measurements is preceded by filtering the measurements acquired by a Hilbert filter. Azevedo discloses a method for reconstructing 3D image (see column 1, lines 11-14) in that weighting of the measurements is preceded by filtering the measurements acquired by a Hilbert filter (see column 8, lines 40-50). Edic 728 as modified by Edic 496 and Azevedo are combinable because both are directed to reconstructing images of the human body. One of ordinary skill in the art would have been motivated to combine Edic 496 as modified by Edic 728 with Azevedo for rearranging the calculations of the measurements of a second series to a first series to incorporate a weighting of the measurements of the detector (see column 3, lines 5-8).

### ***Allowable Subject Matter***

9. Claims 2, 6 and 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Inquires***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANDRAE S. ALLISON whose telephone number is (571)270-1052. The examiner can normally be reached on Monday-Friday, 8:00 am - 5:00 pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on (571) 272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Anand Bhatnagar/  
Primary Examiner, Art Unit 2624  
November 4, 2009

/A. S. A./  
Examiner, Art Unit 2624